Status on Research Funding
At the University of Missouri
2001

D. Lanette Vaughn
Associate Research Analyst, Institutional Research & Planning
Vaughnla@umsystem.edu

March 2001

Institutional Research and Planning
Office of Planning and Budget
University of Missouri System
P&B 2001-2

http://www.system.missouri.edu/planning

EXECUTIVE SUMMARY

This report highlights research funding at the University of Missouri using data provided by the National Science Foundation (NSF). More specifically, it examines research funding at the public AAU institutions and at the four campuses of the University of Missouri. NSF data have been used because they provide consistent data on research funding for all thirty-two public AAU institutions. Please note that the data used in this study are from fiscal year 1999. Although more recent data are available for the University of Missouri, this is the most recent data available for all public AAU institutions. References to the "University of Missouri" or the "University" refer to the four-campus system. Trends in research funding have been examined from 1990 to 1999 and from 1995 to 1999.

The key findings include:

Federal Research Expenditures

- On average, federal research expenditures at the University of Missouri have increased 64% since 1995 and 132% since 1990. This compares to an increase of 18% and 67%, respectively, at the public AAU institutions (Table 1).

- From 1995 to 1999, the University's market share in federal research expenditures among the public AAU institutions increased from 1.11% to 1.54%. (Table 2).

- In terms of federal research expenditures, the University of Missouri ranked 27th among the 32 public AAU institutions in 1999. The University held the rank of 29th in 1990 (Table 3).

- Eighteen of the thirty-two public AAU institutions in 1999 relied on one disciplinary area to provide the majority of their federal research expenditures. In each of these eighteen cases, the discipline area was life sciences (Table 4).

Industry-Sponsored Research Expenditures

- On inspection of the University of Missouri's Industry-Sponsored Research and Development Expenditures, there appears to be a large decline between 1995 and 1996. However, new accounting methods have been responsible, in part, for this decline. Increase, with comparable accounting methods, since 1996, has been steady (Table 6).

- The University of Missouri funds a higher percentage of its research program (41%-50%, depending on campus) with institutional funds than all but one other public AAU institution (Table 7).

ORGANIZATION

The report has been organized into the following sections:

Section I:	Federal Research Expenditures (Tables 1–5)
Section II:	Research Expenditures from Industry (Table 6)
Section III:	Research Expenditures by Source of Funds (Table 7)
Section IV:	Definitions and Technical Notes
Appendix A & B:	Research Expenditures and Campus Comparison Groups

SECTION I:
FEDERAL RESEARCH EXPENDITURES

The federal research expenditures reported in this section include expenditures classified as science and engineering (S&E) research and development (R&D) funds. When trend data are examined, increases or decreases in funding are noted from 1990 to 1999 and from 1995 to 1999. In addition, a definition of *federal research expenditures* is provided in Section IV: Definitions and Technical Notes.

Federal Flow-Through Expenditures
Beginning in 1996, federal research expenditures for the University of Missouri include federal flow-through expenditures. Originating from a federal agency, these expenditures have been awarded to industry, state agencies in Missouri, foundations, or another college or university and then passed on to the University of Missouri. The University has typically classified these expenditures based on the intermediary (i.e., industry, etc.). In 1996, however, the University of Missouri began classifying these expenditures based on their original source, the federal government. Consequently, the increase in federal research expenditures in fiscal years 1996, 1997, 1998 and 1999 for the University of Missouri can be partially attributed to this NSF-accepted classification method.

Please note that annual totals in research expenditures for FY1996 and FY1997 were retroactively changed in 1999. Consequently, these revised totals will not match previously published figures for these two fiscal years.

Table 1:
Public AAU Institutions: Trends in Federal Research Expenditures

Table 1 shows the trend in federal research expenditures for the public AAU institutions and the four campuses of the University of Missouri. Percentage increases in funds are displayed since 1990 and 1995.

- On average, federal research expenditures at the University of Missouri have increased 64% over the past three years and 132% over the past nine years. This compares to an increase of 18% and 67%, respectively, at the public AAU institutions.

The University of Missouri had the most significant percentage gains (64% since 1995 and 132% since 1990) among the public AAU institutions. The University of Maryland, the University of Florida, and the University of Colorado have also made significant percentage gains among the public AAU institutions.

Table 1. Trends in Federal Expenditures for Science and Engineering R&D at Public AAU Institutions 1990, 1995 and 1999

($ in thousands)

Institution	1990	1995	1996	1997	1998	1999	% increase since 1990	% increase since 1995
U of Maryland-College Park	66,410	94,071	99,688	102,928	129,198	145,081	118%	54%
U of Florida	64,614	79,361	86,973	94,231	106,510	122,296	89%	54%
U of Colorado	116,394	169,666	177,517	192,201	228,342	244,686	110%	44%
U of Kansas	26,786	42,209	41,858	46,733	50,567	57,272	114%	36%
U of Pittsburgh	90,700	144,487	149,960	160,833	168,511	194,618	115%	35%
U of Illinois-Urbana	117,168	139,078	145,514	156,366	168,871	185,767	59%	34%
U of Virginia	58,801	85,244	75,256	82,488	93,328	108,495	85%	27%
U of Washington	203,353	291,284	312,695	320,784	336,748	368,112	81%	26%
U of California-Los Angeles	164,442	201,773	236,635	238,919	233,702	251,999	53%	25%
U of Michigan	180,456	275,956	281,062	296,028	311,450	334,226	85%	21%
U of California-Berkeley	131,717	157,826	168,171	186,349	171,135	191,025	45%	21%
U of Iowa	79,046	103,115	105,646	108,534	115,312	122,638	55%	19%
Indiana U	57,155	86,041	90,881	96,087	95,840	102,262	79%	19%
U of N Carolina-Chapel Hill	92,468	156,626	157,034	153,985	171,505	182,935	98%	17%
U of California-Santa Barbara	47,873	63,443	73,400	74,149	68,408	74,026	55%	17%
Michigan State U	58,221	77,499	77,243	82,977	81,146	89,835	54%	16%
U of Oregon	20,151	23,789	26,411	26,020	27,041	27,336	36%	15%
U of Texas-Austin	109,593	143,939	147,808	151,954	165,082	164,913	50%	15%
SUNY-Buffalo	66,876	75,713	87,813	78,092	76,037	85,490	28%	13%
Ohio State U	78,878	122,660	118,811	122,582	124,177	135,216	71%	10%
U of Wisconsin-Madison	178,862	229,381	233,174	233,760	240,513	249,961	40%	9%
U of California-Irvine	52,492	69,655	72,994	71,472	65,902	75,505	44%	8%
U of Minnesota	143,810	194,819	198,927	200,149	204,741	207,761	44%	7%
Pennsylvania State U	136,656	187,481	190,688	185,206	186,274	199,105	46%	6%
U of Arizona	92,920	168,791	154,004	152,221	161,999	178,126	92%	6%
Rutgers, the State U of NJ	40,977	72,567	67,588	68,225	69,829	75,664	85%	4%
U of California-San Diego	182,555	284,445	291,917	274,860	262,303	292,007	60%	3%
Purdue U	64,464	93,256	91,632	91,969	92,844	95,708	48%	3%
U of California-Davis	77,424	122,645	130,188	123,673	114,912	124,463	61%	1%
U of Nebraska-Lincoln	22,686	36,897	32,352	41,269	41,888	36,977	63%	0%
Iowa State U	34,043	58,766	54,904	52,938	51,196	54,179	59%	-8%
Public AAU Institution Average	92,193	130,725	134,798	137,677	142,429	154,119	67%	18%
University of Missouri:*								
Columbia	24,422	32,420	38,938	43,335	45,448	53,875	121%	66%
Kansas City	2,767	4,506	5,087	5,380	6,199	7,206	160%	60%
Rolla	3,863	5,834	7,542	8,080	7,934	8,731	126%	50%
St Louis	1,167	2,840	3,349	3,650	3,975	4,841	315%	70%
University Total	32,219	45,600	54,916	60,445	63,556	74,653	132%	64%

Source: National Science Foundation, Survey of Research and Development Expenditures at Colleges and Universities, FY 1999, B-33.
Federally Financed R&D Expenditures at Universities and Colleges: Fiscal Years 1992-1999.

* Federal flow-through funds are included in the University of Missouri figures beginning in FY 1996.

P&B, 2001-2

Table 2:
Public AAU Institutions: Market Share Increases and Decreases in Federal Research Expenditures

An alternative approach to understanding how well the University of Missouri has "competed" with other public AAU institutions is to examine the market share of each institution over time. That is, of the total federal research expenditures secured by the public AAU institutions in a given year, what percentage of that total has each institution secured? How has that institution's market share shifted from year to year? One advantage of market share analysis is that it helps to level the playing field among major and less-than-major players who compete for research dollars. In Table 2, the market share of federal research expenditures has been calculated for the public AAU institutions in 1990, 1995, and 1999.

- Among the public AAU institutions, the market share for the University of Missouri held steady at 1.11% from 1990 to 1995. But since that time, the University's market share has increased from 1.11% to 1.54%.

Table 2. Market Share Gain or Loss in Federal Expenditures for Science and Engineering R&D at Public AAU Institutions, 1990 to 1999

($ in thousands)

	1990		1995		1999			
Institution	$	Market Share	$	Market Share	$	Market Share	MS +/- since 1990	MS +/- since 1995
U of Colorado	116,394	4.03	169,666	4.14	244,686	5.04	1.02	0.90
U of Maryland-College Park	66,410	2.30	94,071	2.30	145,081	2.99	0.69	0.69
U of Florida	64,614	2.24	79,361	1.94	122,296	2.52	0.28	0.58
U of Pittsburgh	90,700	3.14	144,487	3.53	194,618	4.01	0.87	0.49
U of Washington	203,353	7.04	291,284	7.11	368,112	7.59	0.55	0.48
U of Illinois-Urbana	117,168	4.05	139,078	3.39	185,767	3.83	-0.23	0.43
U of Missouri-Total	32,219	1.11	45,600	1.11	74,653	1.54	0.42	0.43
U of California-Los Angeles	164,442	5.69	201,773	4.92	251,999	5.19	-0.50	0.27
U of Virginia	58,801	2.03	85,244	2.08	108,495	2.24	0.20	0.16
U of Michigan	180,456	6.24	275,956	6.73	334,226	6.89	0.64	0.15
U of Kansas	26,786	0.93	42,209	1.03	57,272	1.18	0.25	0.15
U of California-Berkeley	131,717	4.56	157,826	3.85	191,025	3.94	-0.62	0.09
U of Iowa	79,046	2.73	103,115	2.52	122,638	2.53	-0.21	0.01
Indiana U	57,155	1.98	86,041	2.10	102,262	2.11	0.13	0.01
U of Oregon	20,151	0.70	23,789	0.58	27,336	0.56	-0.13	-0.02
U of California-Santa Barbara	47,873	1.66	63,443	1.55	74,026	1.53	-0.13	-0.02
Michigan State U	58,221	2.01	77,499	1.89	89,835	1.85	-0.16	-0.04
U of N Carolina-Chapel Hill	92,468	3.20	156,626	3.82	182,935	3.77	0.57	-0.05
SUNY-Buffalo	66,876	2.31	75,713	1.85	85,490	1.76	-0.55	-0.09
U of Texas-Austin	109,593	3.79	143,939	3.51	164,913	3.40	-0.39	-0.11
U of Nebraska-Lincoln	22,686	0.78	36,897	0.90	36,977	0.76	-0.02	-0.14
U of California-Irvine	52,492	1.82	69,655	1.70	75,505	1.56	-0.26	-0.14
Ohio State U	78,878	2.73	122,660	2.99	135,216	2.79	0.06	-0.21
Rutgers, the State U of NJ	40,977	1.42	72,567	1.77	75,664	1.56	0.14	-0.21
Purdue U	64,464	2.23	93,256	2.28	95,708	1.97	-0.26	-0.30
Iowa State U	34,043	1.18	58,766	1.43	54,179	1.12	-0.06	-0.32
U of California-Davis	77,424	2.68	122,645	2.99	124,463	2.57	-0.11	-0.43
U of Wisconsin-Madison	178,862	6.19	229,381	5.60	249,961	5.15	-1.04	-0.45
U of Arizona	92,920	3.21	168,791	4.12	178,126	3.67	0.46	-0.45
Pennsylvania State U	136,656	4.73	187,481	4.57	199,105	4.10	-0.62	-0.47
U of Minnesota	143,810	4.98	194,819	4.75	207,761	4.28	-0.69	-0.47
U of California-San Diego	182,555	6.32	284,445	6.94	292,007	6.02	-0.30	-0.92
		100.00		100.00		100.00		

Market Share (MS): An institution's federal research expenditures in a given year divided by the federal research expenditures for all public AAU institutions in the same year.

Source: National Science Foundation, Survey of Research and Development Expenditures at Colleges and Universities, FY 1999, B-33. Federally Financed R&D Expenditures at Universities and Colleges: Fiscal Years 1992-1999.

P&B, 2001-2

Table 3:
Public AAU Institutions: The University of Missouri's Rank in Federal Research Expenditures

Table 3 ranks the public AAU institutions in terms of federal research dollars secured in 1990 and 1999.

- The University of Missouri ranked 27th among the 32 public AAU institutions in 1999. This is an improvement over its 1990 ranking (29th).

Table 3. Federal Expenditures for Science and Engineering R&D: Changes in Rank Among the Public AAU Institutions between 1990 and 1999

($ in thousands)

1990			1999		
Rank	**Institution**	**$**	**Rank**	**Institution**	**$**
1	U of Washington	203,353	1	U of Washington	368,112
2	U of California-San Diego	182,555	2	U of Michigan	334,226
3	U of Michigan	180,456	3	U of California-San Diego	292,007
4	U of Wisconsin-Madison	178,862	4	U of California-Los Angeles	251,999
5	U of California-Los Angeles	164,442	5	U of Wisconsin-Madison	249,961
6	U of Minnesota	143,810	6	U of Colorado	244,686
7	Pennsylvania State U	136,656	7	U of Minnesota	207,761
8	U of California-Berkeley	131,717	8	Pennsylvania State U	199,105
9	U of Illinois-Urbana	117,168	9	U of Pittsburgh	194,618
10	U of Colorado	116,394	10	U of California-Berkeley	191,025
11	U of Texas-Austin	109,593	11	U of Illinois-Urbana	185,767
12	U of Arizona	92,920	12	U of N Carolina-Chapel Hill	182,935
13	U of N Carolina-Chapel Hill	92,468	13	U of Arizona	178,126
14	U of Pittsburgh	90,700	14	U of Texas-Austin	164,913
15	U of Iowa	79,046	15	U of Maryland-College Park	145,081
16	Ohio State U	78,878	16	Ohio State U	135,216
17	U of California-Davis	77,424	17	U of California-Davis	124,463
18	SUNY-Buffalo	66,876	18	U of Iowa	122,638
19	U of Maryland-College Park	66,410	19	U of Florida	122,296
20	U of Florida	64,614	20	U of Virginia	108,495
21	Purdue U	64,464	21	Indiana U	102,262
22	U of Virginia	58,801	22	Purdue U	95,708
23	Michigan State U	58,221	23	Michigan State U	89,835
24	Indiana U	57,155	24	SUNY-Buffalo	85,490
25	U of California-Irvine	52,492	25	Rutgers, the State U of NJ	75,664
26	U of California-Santa Barbara	47,873	26	U of California-Irvine	75,505
27	Rutgers, the State U of NJ	40,977		University of Missouri-Total	74,653
28	Iowa State U	34,043	27	U of California-Santa Barbara	74,026
	University Of Missouri-Total	32,219	28	U of Kansas	57,272
29	U of Kansas	26,786	29	Iowa State U	54,179
30	U of Missouri-Columbia	24,422	30	U of Missouri-Columbia	53,875
31	U of Nebraska-Lincoln	22,686	31	U of Nebraska-Lincoln	36,977
32	U of Oregon	20,151	32	U of Oregon	27,336

Source: National Science Foundation, Survey of Research and Development Expenditures at Colleges and Universities, FY 1999, Table B-33. Federally Financed R&D Expenditures at Universities and Colleges: Fiscal Years 1992-1999.

P&B, 2001-2

Table 4:
Distribution of Federal Research Expenditures by Field

Table 4 displays the federal research expenditures by discipline area for the University of Missouri and other public AAU institutions.

- In 1999 the majority of federal research funds expended by the public AAU institutions were in the life sciences (52%) followed by engineering (16%), the physical sciences (13%) and environmental sciences (7%). The remaining disciplines accounted for 12% of the expenditures.

- Eighteen of the thirty-two public AAU institutions in 1999 relied on one disciplinary area to provide the majority of their federal research expenditures. In every one of these cases the discipline area was life sciences.

- Where Columbia and Kansas City secured 69% and 77% of their federal expenditures from life sciences, respectively, Rolla garnered 70% of its federal funds in engineering. St Louis received federal funds in more evenly dispersed percentages with 32% being in the physical sciences, 22% of its federal funding in life sciences, 19% in psychology and 27% in the social sciences.

Table 4. Federal R&D Expenditures at the Public AAU Institutions by Science and Engineering Field, FY1999

Institution	Engi-neering	Physical	Environ-mental	Math & computer	Life sciences	Psy-chology	Social sciences	Other sciences	Total
	Row Percentages								(in thousands)
U of Washington	6	5	15	2	67	2	2	0	368,112
University of Michigan	25	5	1	2	55	1	11	0	334,226
U CA San Diego	9	9	23	10	46	1	2	0	292,007
U CA Los Angeles	12	11	3	4	67	2	1	0	251,999
U WI-Madison	14	12	7	3	54	6	5	0	249,961
University of Colorado	7	15	25	3	47	2	2	0	244,686
University of Minnesota	12	7	3	4	71	2	1	0	207,761
Pennsylvania State U	40	12	8	1	28	3	6	1	199,105
University of Pittsburgh	2	5	0	2	86	2	2	1	194,618
U CA Berkeley	27	29	2	2	34	2	3	1	191,025
U of Illinois Urbana-Cham	29	18	6	23	18	3	2	2	185,767
U of NC Chapel Hill	0	7	3	4	76	2	9	0	182,935
University of Arizona	14	30	4	3	45	1	3	0	178,126
U TX at Austin	37	29	4	15	12	1	1	0	164,913
U MD at College Park	29	23	4	10	8	1	24	0	145,081
Ohio State University	15	9	4	3	58	2	9	0	135,216
U CA Davis	8	8	1	2	79	1	0	0	124,463
U of Iowa	7	9	0	1	79	2	2	0	122,638
University of Florida	17	11	2	4	62	3	2	0	122,296
University of Virginia	16	10	4	5	62	3	1	0	108,495
Indiana University	0	17	1	2	69	6	5	0	102,262
Purdue University	38	14	3	4	36	2	3	0	95,708
Michigan State University	5	23	1	2	56	2	11	0	89,835
SUNY at Buffalo	17	6	0	3	67	5	1	0	85,490
Rutgers the State U NJ	17	16	11	11	35	5	6	0	75,664
U CA Irvine	6	16	3	5	65	2	3	0	75,505
U CA Santa Barbara	37	22	22	4	7	2	6	0	74,026
University of Kansas	10	10	4	2	68	0	1	4	57,272
Iowa State University	24	8	4	7	39	0	16	1	54,179
U of Nebraska at Lincoln	12	15	19	3	38	0	9	4	36,977
University of Oregon	2	24	7	12	45	7	4	0	27,336
Public AAU Distribution	16	13	7	5	52	2	5	0	
University of Missouri:									
Columbia	11	5	1	1	69	6	7	0	53,875
Rolla	70	23	3	3	0	0	0	0	8,731
Kansas City	0	7	1	14	77	0	0	1	7,206
St Louis	0	32	0	1	22	19	27	0	4,841
University Total	16	9	1	1	59	5	7	0	74,653

Source: National Science Foundation/SRS, Survey of Research and Development Expenditures at Universities and Colleges, FY1999, B-43. Federally Financed R&D Expenditures at Public Universities and Colleges, by science and Engineering field: Fiscal year 1999.

P&B, 2001-2

Table 5:
Market Share of Federal Research Expenditures within Each Discipline Area among the Public AAU Institutions

Table 5 displays each public AAU institution's market share within the eight discipline areas. The University of Missouri's federal research expenditures from the four campuses are pooled.

- The discipline areas where the University of Missouri secured the most significant market share were in psychology (3.4%), social sciences (2.2%), life sciences (1.7%), and engineering (1.6%).

- Market share leaders in each discipline area were: University of Michigan in engineering (10.9%), the University of California, Berkeley in the physical sciences (8.9%), the University of California, San Diego in environmental sciences (19.9%), and the University of Illinois in math and computer science (18.5%). In addition, the leaders by discipline area included the University of Washington in life sciences (9.7%), University Wisconsin-Madison in psychology (13.7%), and the University of Michigan in the social sciences (16.7%).

Table 5. Market Share in Federal R&D Expenditures by Discipline Area Among the Public AAU Institutions, FY1999

Institution	Engi-neering	Physical	Environ-mental	Math & computer	Life sciences	Psy-chology	Social sciences	Other sciences	Total
									($ in thousands)
U of Washington	2.9	3.1	16.9	3.2	9.7	7.5	3.7	0.0	368,112
University of Michigan	10.9	2.7	1.4	2.2	7.2	3.9	16.7	0.0	334,226
U CA San Diego	3.3	4.4	19.9	12.5	5.3	3.1	2.1	0.3	292,007
U CA Los Angeles	3.8	4.5	2.0	4.1	6.7	5.0	1.4	0.0	251,999
U WI-Madison	4.5	4.6	4.9	3.1	5.3	13.7	6.1	0.0	249,961
University of Colorado	2.1	5.7	18.4	3.0	4.6	3.9	1.9	3.3	244,686
University of Minnesota	3.1	2.3	1.8	3.6	5.8	4.5	1.0	0.0	207,761
Pennsylvania State U	10.5	3.8	4.7	1.1	2.2	5.9	5.5	13.9	199,105
University of Pittsburgh	0.5	1.4	0.1	1.5	6.6	3.7	1.9	9.3	194,618
U CA Berkeley	6.7	8.9	1.2	1.7	2.5	4.2	2.4	10.1	191,025
U of Illinois Urbana-Cham	7.0	5.3	3.2	18.5	1.3	4.2	1.6	22.2	185,767
U of NC Chapel Hill	0.0	2.0	1.9	3.0	5.4	2.4	7.0	0.0	182,935
University of Arizona	3.3	8.6	2.0	2.3	3.2	1.0	2.6	0.0	178,126
U TX at Austin	8.0	7.8	1.8	10.4	0.8	2.0	1.0	0.8	164,913
U MD at College Park	5.6	5.3	1.6	6.4	0.5	1.4	15.8	0.0	145,081
Ohio State University	2.7	1.9	1.7	1.5	3.1	2.6	5.6	2.7	135,216
U CA Davis	1.3	1.5	0.5	1.1	3.9	1.1	0.2	0.0	124,463
U of Iowa	1.1	1.9	0.1	0.4	3.8	1.8	1.0	0.0	122,638
University of Florida	2.6	2.2	0.8	2.2	3.0	2.8	0.9	0.0	122,296
University of Virginia	2.2	1.7	1.4	2.1	2.7	2.5	0.3	0.0	108,495
Indiana University	0.0	2.8	0.3	0.9	2.8	5.6	2.2	0.6	102,262
Purdue University	4.8	2.1	0.8	1.8	1.4	1.5	1.2	1.2	95,708
Michigan State University	0.6	3.4	0.2	0.9	2.0	1.5	4.3	0.5	89,835
SUNY at Buffalo	1.9	0.9	0.1	1.2	2.3	3.5	0.6	0.0	85,490
Rutgers the State U NJ	1.7	2.0	2.5	3.5	1.0	3.0	1.9	0.1	75,664
U CA Irvine	0.6	2.0	0.7	1.6	1.9	1.4	1.0	0.0	75,505
University of Missouri-Total	1.6	1.1	0.2	0.8	1.7	3.4	2.2	0.3	74,653
U CA Santa Barbara	3.6	2.6	4.9	1.2	0.2	1.3	1.8	0.6	74,026
University of Kansas	0.8	0.9	0.7	0.6	1.5	0.1	0.3	17.8	57,272
Iowa State University	1.7	0.7	0.6	1.6	0.8	0.1	3.9	4.5	54,179
U of Nebraska at Lincoln	0.1	1.0	2.1	0.5	0.6	0.2	1.5	11.5	36,977
University of Oregon	0.6	0.9	0.6	1.4	0.5	1.6	0.5	0.0	27,336
Public AAU Distribution	761,181	619,925	331,048	232,395	2,538,456	111,942	222,546	23,591	4,852,337

Source: National Science Foundation/SRS, Survey of Research and Development Expenditures at Universities and Colleges, FY1999, B-43.
Federally Financed R&D Expenditures at Public Universities and Colleges, by Science and Engineering field: Fiscal year 1999.

P&B, 2001-2

Section II:

RESEARCH EXPENDITURES FROM INDUSTRY

Table 6:
Industry-Sponsored Research Expenditures

Table 6 shows the growth in industry-sponsored research expenditures for the public AAU institutions from 1990 to 1999 and from 1995 to 1999. The institutions are arranged in descending order based on gain or loss since 1995. Please note that a definition of *industry-sponsored research expenditures* is provided in Section III: Definitions and Technical Notes.

- The University of Texas at Austin, Ohio State University, and University of California, San Diego have shown the largest gains in industry-sponsored research expenditures among the public AAU institutions.

- The institutions that lead the public AAU group in terms of industry-sponsored research are Pennsylvania State University ($65.7 million), Ohio State University ($52 million), and the University of Washington ($51.3 million).

- The University of Missouri secured $6.5 million in industry-sponsored research expenditures in 1998 and 6.7 million in 1999.

Table 6. Industry-Sponsored R&D Expenditures at Public AAU Institutions Since 1990 and 1995

($ in thousands)

Institution	1990	1995	1996	1997	1998	1999	$ Gain/Loss since 1995
U TX Austin	3,507	3,257	15,029	29,887	31,326	39,729	36,472
Ohio State University	14,744	21,827	30,870	36,685	40,401	52,034	30,207
U CA San Diego	9,135	11,363	15,130	19,266	26,814	31,356	19,993
U CA Los Angeles	8,310	14,892	15,788	19,586	27,817	34,404	19,512
University of Florida	12,237	10,611	23,532	25,217	21,393	28,183	17,572
Pennsylvania State U	34,806	50,225	52,771	56,666	63,319	65,698	15,473
U of Washington	22,215	36,892	36,180	37,744	38,370	51,319	14,427
U of Iowa	6,827	11,359	14,862	15,712	17,262	20,778	9,419
U CA Davis	7,461	8,053	9,387	9,362	14,077	16,242	8,189
U CA Berkeley	10,892	13,842	15,128	17,125	20,483	21,928	8,086
U CA Irvine	3,115	9,139	10,391	10,445	15,712	16,539	7,400
Iowa State University	5,525	8,017	7,407	8,499	13,717	14,905	6,888
University of Kansas	4,473	8,149	9,356	8,201	8,281	14,393	6,244
University of Michigan	27,128	28,987	34,975	31,411	33,029	34,432	5,445
University of Pittsburgh	6,481	8,208	7,880	9,753	10,436	12,990	4,782
Purdue University	11,632	25,147	25,720	26,090	26,988	28,856	3,709
U of NC Chapel Hill	2,179	2,403	2,592	3,311	4,860	5,886	3,483
U of Nebraska Lincoln	3,394	3,145	3,465	4,651	4,721	5,466	2,321
University of Colorado	7,426	7,607	8,902	9,403	9,963	9,867	2,260
U CA Santa Barbara	2,655	2,576	2,988	2,876	3,666	4,742	2,166
Rutgers the State U NJ	6,754	7,797	7,079	8,848	9,038	9,833	2,036
University of Arizona	10,246	15,300	13,106	14,964	16,392	16,660	1,360
U WI Madison	12,123	12,948	13,871	14,832	14,371	14,172	1,224
U of Illinois Urbana	20,762	11,832	12,365	11,761	13,917	12,864	1,032
University of Minnesota	18,086	23,427	23,726	24,196	24,094	23,933	506
Michigan State University	4,557	7,853	6,818	6,973	7,250	7,647	-206
Indiana University	2,316	5,815	5,357	4,242	6,333	4,820	-995
University of Virginia	6,406	15,442	4,552	7,627	12,400	12,989	-2,453
SUNY Buffalo	2,118	13,390	13,186	14,480	3,021	5,485	-7,905
U MD College Park	14,229	25,431	24,044	5,009	2,127	3,053	-22,378
Public AAU Average	10,058	14,164	15,549	16,494	18,053	20,707	
University of Missouri:							
Columbia	9,130	10,114	3,158	3,777	4,348	3,832	-6,282
Kansas City	1,383	636	154	348	505	427	-209
Rolla	2,186	1,316	2,364	1,575	1,361	2,079	763
St Louis	69	409	191	274	273	386	-23
University Total	12,768	12,475	5,867	5,974	6,487	6,724	-5,751

Source: National Science Foundation, Survey of Research and Development Expenditures at Colleges and Universities, FY 1999, B-38. Industry-Sponsored R&D Expenditures at Universities and Colleges: Fiscal years 1992-1999.

P&B, 2001-2

SECTION III:

Research Expenditures by Source of Funds (Table 7)

Universities have sources other than federal agencies for funding research operations for their institution. These sources include funds from state & local agencies, business & industry, funds that are provided by the institution itself and other funding sources.

Table7:
Sources of Research Expenditures

Table 7 shows the sources of research expenditures for the public AAU institutions. The institutions are arranged in descending order, based on the institution's percentage of research funds that are provided by the federal government.

- The University of Oregon, University of Pittsburgh, University of Colorado, and University of Washington received over 75% of their research expenditures from the federal government, ranking them at the top among the public AAU institutions.

- Among the thirty-two public AAU institutions, the University of Missouri ranks near the bottom in terms of the percentage of research funds it receives from the federal government.

- The University of Missouri funds a higher percentage of its research program (41% to 50%, depending on campus) with institutional funds than all but one other public AAU institution.

Table 7. Total R&D Expenditures at the Public AAU Institutions by Source of Funds, FY1999

Institution	Federal Gov't	State & Local	Industry	Institu-tional*	Other	Total ($ in thousands)
University of Oregon	84%	1%	0%	10%	4%	32,695
University of Pittsburgh	78%	1%	5%	9%	7%	249,477
University of Colorado	77%	2%	3%	8%	10%	318,618
U of Washington	76%	2%	11%	9%	2%	482,659
U of NC Chapel Hill	72%	6%	2%	20%	0%	252,767
U CA Santa Barbara	71%	2%	5%	15%	8%	104,561
University of Virginia	69%	4%	8%	10%	9%	157,487
University of Michigan	66%	1%	7%	20%	6%	508,619
U TX at Austin	64%	7%	15%	12%	2%	258,122
U CA San Diego	63%	5%	7%	16%	10%	461,632
U of Iowa	59%	3%	10%	23%	5%	207,135
U MD at College Park	56%	17%	1%	22%	3%	257,628
University of Minnesota	56%	13%	6%	17%	8%	371,384
University of Arizona	56%	2%	5%	33%	4%	320,245
U WI-Madison	54%	8%	3%	22%	12%	462,725
U CA Irvine	53%	3%	12%	20%	12%	141,842
U CA Los Angeles	53%	2%	7%	23%	15%	477,620
Indiana University	52%	1%	2%	35%	9%	194,790
Pennsylvania State U	52%	4%	17%	26%	0%	379,402
U of Illinois Urbana-Cham	52%	11%	4%	30%	4%	358,247
SUNY at Buffalo	51%	3%	3%	25%	17%	166,823
Michigan State University	43%	18%	4%	31%	4%	207,912
University of Kansas	43%	9%	11%	27%	10%	132,752
U CA Berkeley	42%	11%	5%	33%	9%	451,539
Purdue University	42%	11%	13%	33%	0%	226,411
Ohio State University	42%	15%	16%	18%	8%	322,810
U CA Davis	40%	7%	5%	39%	8%	307,950
University of Florida	40%	22%	9%	26%	3%	304,447
U of Missouri Columbia	36%	11%	3%	45%	4%	149,002
Rutgers the State U NJ	35%	12%	5%	40%	8%	213,838
Iowa State University	34%	30%	9%	26%	2%	161,301
U of Nebraska at Lincoln	28%	3%	4%	59%	5%	131,046
Public AAU Average	54%	8%	7%	24%	7%	
Columbia	36%	11%	3%	45%	4%	149,002
Kansas City	50%	0%	3%	41%	6%	14,331
Rolla	34%	2%	8%	50%	6%	25,893
St Louis	47%	2%	4%	45%	3%	10,294

* Institutional funds include: 1) institutionally financed funds and 2) unreimbursed costs.
Source: NSF, Survey of R&D Expenditures at Colleges and Universities, FY1999,B-36 Federally Financed R&D Expenditures at Universities and Colleges: Fiscal Years 1991-1999.

P&B, 2001-2

SECTION IV:
DEFINITIONS AND TECHNICAL NOTES

The following definitions, provided by the National Science Foundation (NSF), are most relevant to the tables in this report:

> *Federal research expenditures:* when funds for research from the federal government are actually spent they are then considered "expenditures". For example, if the University received a two-year, two million dollar grant from NASA in FY1993 and spent $1.5 million the first year and $0.5 million in the second year, the federal expenditures would be $1.5 million for FY1993 and $0.5 million for FY1994. The reporting of expenditures, in contrast to obligations, provides a more accurate picture of an institution's research performance because it represents funds that have been already spent as compared to funds that have been promised or are expected. Furthermore, expenditure figures are less likely to show major shifts from year to year because funds received for multi-year grants are only reported in the year that they are spent.
>
> *Industry-sponsored research expenditures:* these are funds provided by profit making organizations and expended by the University for research-related purposes. These amounts are reported in the fiscal year that they are expended.

The National Science Foundation has historically reported research obligations and expenditures from a number of different perspectives. In this report, specifically, academic Science & Engineering (S&E) obligations and expenditures for Research & Development (R&D) are examined. Thus, funds received from the federal government for Plant, Facilities & Equipment; Fellowships, Traineeships, and Training Grants; General Support, and for other categories have been excluded. For brevity, "Science and Engineering" and "Research and Development" have not been repeated in the text of this document.

For further clarification, please see "IB99-4: Defining Federal Research Expenditures, Federal Research Obligations, and Federal Research Awards" at the following website: http://www.system.missouri.edu/planning/Issue_Brief/IB99-4.html.

Questions or Comments

Questions or comments should be directed to Dr. Lanette Vaughn, Associate Research Analyst, Institutional Research and Planning, 717 Lewis Hall, University of Missouri System, (573) 884-9201, vaughnla@umsystem.edu.

APPENDIX A AND B:
RESEARCH EXPENDITURES AND CAMPUS COMPARATOR GROUPS

In response to the University-wide Strategic Planning initiative, the following tables were added to the Research Funding Report. Appendix A examines federal research expenditures relative to a different group of comparator institutions for each of the University of Missouri campuses. Specifically, annual growth and market share are reported. Appendix B examines industry-sponsored research expenditures relative to the same group of comparator institutions for each campus. In these tables, annual growth and rank are reported.

Appendix A

Federal Research Expenditures for Science and Engineering R&D at the University of Missouri Campuses and Respective Comparison Groups, FY1997, FY1998, FY1999

($ in thousands)

UM-Columbia Comparison Group	1997	1998	1999	2 Year '% +/-
U of Missouri Columbia	**43,335**	**45,448**	**53,875**	**24.3%**
Louisiana St U, All Camp	65,257	67,090	75,831	16.2%
Colorado State University	79,393	80,451	91,943	15.8%
University of Kentucky	62,128	60,760	66,184	6.5%
University of Georgia	54,364	54,712	56,080	3.2%
Iowa State University	52,938	51,196	54,179	2.3%
U CA Davis	123,673	114,912	124,463	0.6%
NC State University	69,473	79,533	66,310	-4.6%
U of Tennessee System	74,049	69,793	70,187	-5.2%
U of Nebraska Lincoln	41,269	41,888	36,977	-10.4%
West Virginia University	29,443	24,985	26,264	-10.8%
VA Polytech Inst & St U	87,657	82,734	75,386	-14.0%
Total	782,979	773,502	797,679	1.9%
Market Share for UM-Columbia	5.5%	5.9%	6.8%	

UM-Kansas City Comparison Group*	1997	1998	1999	2 Year '% +/-
U of Missouri Kansas City	**5,380**	**6,199**	**7,206**	**33.9%**
University of IL Chicago	70,739	73,797	86,406	22.1%
U WI Milwaukee	8,156	8,936	9,409	15.4%
U of Louisville	13,521	15,067	15,536	14.9%
Temple U	26,374	28,793	29,734	12.7%
U of Alabama Birmingham	150,501	166,830	165,223	9.8%
Wayne State University	53,707	57,646	57,610	7.3%
Virginia Commonwealth U	44,982	48,167	48,175	7.1%
U of Houston	21,695	22,018	20,443	-5.8%
Total	395,055	427,453	439,742	11.3%
Market Share for UM-Kansas City	1.4%	1.5%	1.6%	

*Data were unavailable for IUPU-Indianapolis.

Continued on next page

Appendix A continued

($ in thousands)

UM-Rolla Comparison Group**	1997	1998	1999	2 Year '% +/-
Michigan Tech University	12,941	13,938	16,107	24.5%
Colorado School of Mines	9,330	8,694	10,704	14.7%
SD Sch of Mines & Tech	2,990	3,221	3,300	10.4%
Clarkson University	3,368	3,010	3,694	9.7%
U of Missouri Rolla	**8,080**	**7,934**	**8,731**	**8.1%**
Rensselaer Polytech Inst	22,785	21,774	22,803	0.1%
Worcester Polytech Inst	7,315	5,230	4,292	-41.3%
Kettering University	176	192	89	-49.4%
Total	66,985	63,993	69,720	4.1%
Market Share for UM-Rolla	12.1%	12.4%	12.5%	

** Data were unavailable for Rose-Hulman Institute of Technology.

UM-St Louis Comparison Group	1997	1998	1999	2 Year '% +/-
University of Toledo	2,937	5,366	5,682	93.5%
U of Akron	5,146	4,042	7,140	38.7%
U of Missouri St Louis	**3,650**	**3,975**	**4,841**	**32.6%**
Witchita State U	2,602	2,646	3,260	25.3%
Wright State University	10,001	10,832	12,365	23.6%
The University of Memphis	5,413	5,849	6,364	17.6%
U WI Milwaukee	8,156	8,936	9,409	15.4%
Florida International U	13,828	14,243	15,757	13.9%
San Diego State U	20,237	19,721	19,724	-2.5%
UT-Arlington	26,829	11,294	6,089	-77.3%
Total	98,799	86,904	90,631	-8.3%
Market Share for UM-St Louis	3.7%	4.6%	5.3%	

Source: NSF Survey of R&D Expenditures at Colleges and Universities, FY1999,B-33
Federally Financed R&D Expenditures at Universities and Colleges: Fiscal Years 1992-1999.

P&B, 2001-2

Appendix B

Industry-Sponsored Research Expenditures for Science and Engineering R&D at the University of Missouri Campuses and Respective Comparison Groups, FY1997, FY1998, FY1999

($ in thousands)

UM-Columbia Comparison Group	1997	1998	1999	2 Year '%+/-	Rank by 99 $
Iowa State University	8,499	13,717	14,905	75.4%	5
U CA Davis	9,362	14,077	16,242	73.5%	2
West Virginia University	3,719	4,547	5,532	48.7%	10
University of Kentucky	11,259	13,668	15,109	34.2%	4
Colorado State U	5,712	6,155	7,213	26.3%	9
U of Tennessee System	12,675	12,551	15,903	25.5%	3
U of Nebraska Lincoln	4,651	4,721	5,466	17.5%	11
NC State University	26,834	31,429	31,478	17.3%	1
VA Polytech Inst & St U	11,385	12,132	13,287	16.7%	6
University of Georgia	10,283	10,534	11,034	7.3%	8
U of Missouri Columbia	**3,777**	**4,348**	**3,832**	1.5%	**12**
Louisiana St U, All Campus	13,331	12,157	13,187	-1.1%	7
Total	121,487	140,036	152,378		

UM-Kansas City Comparison Group*	1997	1998	1999	2 Year '%+/-	Rank by 99 $
U of Louisville	3,522	4,800	6,100	73.2%	5
University of IL Chicago	6,947	9,424	9,683	39.4%	3
U of Missouri Kansas City	**348**	**505**	**427**	22.7%	**8**
Wayne State University	10,959	11,207	10,660	-2.7%	1
U of Houston	1,815	1,707	1,762	-2.9%	6
Virginia Commonwealth U	9,172	8,478	8,062	-12.1%	4
U of Alabama Birmingham	16,233	16,842	10,181	-37.3%	2
Temple U	4,690	8,855	1,284	-72.6%	7
U WI Milwaukee	374	554			
Total	42,869	47,089	31,949		

*Data were not available for UIPU-Indianapolis or for University Wisconsin Milwaukee in 1999.

Continued on next page

Appendix B continued

($ in thousands)

UM-Rolla Comparison Group*	1997	1998	1999	2 Year '%+/-	Rank by 99 $
U of Missouri Rolla	**1,575**	**1,361**	**2,079**	**32.0%**	**4**
Colorado School of Mines	8,038	9,877	9,292	15.6%	2
Rensselaer Polytech Inst	9,340	10,974	10,084	8.0%	1
Michigan Tech University	3,919	3,747	3,578	-8.7%	3
Clarkson University	1,512	1,500	1,226	-18.9%	5
Worcester Polytech Inst	1,185	1,485			
Total	24,384	27,459	26,259		

* Data were not available for Kettering University, SD Sch of Mines and Tech, and Rose-Hulman Institute of Technology or for Worester Polytechnic Institute in 1999.

UM-St Louis Comparison Group*	1997	1998	1999	2 Year '%+/-	Rank by 99 $
U of Missouri St Louis	**274**	**273**	**386**	40.9%	**4**
Wright State University	1,409	1,325	1,717	21.9%	3
UT-Arlington	2,641	2,642	2,220	-15.9%	1
U of Akron	3,411	2,767	2,150	-37.0%	2
University of Wisconsin Milwaukee	374	554			
The University of Memphis	903	784			
Total	8,738	8,072	6,087		

*Data were not available for the Florida International U, San Diego State U, U of Toledo and Wichita State University. In addition, data were unavailable for University of Wisconsin Milwaukee and The University of Memphis in 1999.

Source: NSF Survey of R&D Expenditures at Colleges and Universities, FY1999,B-38
Federally Financed R&D Expenditures at Universities and Colleges: Fiscal Years 1992-1999.

P&B, 2001-2